

PRELIMINARY STUDIES ON THE
HYDRACARINA OF MICHIGAN:
THE GENUS *LIMNESIA*, SUBGENERA
LIMNESIOPSIS PIERSIG AND
LIMNESIELLA DADAY¹

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The genus *Limnesia* is represented in Michigan by members of four subgenera: *Limnesia s.s.*, *Tetralimnesia*, *Limnesiopsis* and *Limnesiella*. Only the latter two subgenera will be treated in this paper. Both *Limnesiopsis* and *Limnesiella* have at times been considered to be distinct genera. However, most workers now look upon them as merely polyacetabulate members of the genus *Limnesia*. There has been some confusion between *Limnesia (Limnesiopsis) anomala* and *Limnesia (Limnesiella) marshallae*, the only previously described species belonging to these subgenera known from North America. It is hoped that a redescription of these two species will clear up this situation. In addition, a new *Limnesiella* is described from Michigan.

Subgenus *Limnesiopsis* Piersig

Limnesiopsis Piersig, 1897. Sitzungsab. Naturf. Ges. Leipzig, 22/23:52.

Subgeneric diagnosis: Genital acetabula numerous; claws with a series of three to five minor clawlets posterior to the two major clawlets; acetabular plates of male broadly joined at anterior and posterior ends.

Limnesia (Limnesiopsis) anomala Koenike

Figs. 1, 2, 7, 12

Limnesia anomala Koenike, 1895. Abh. naturw. Ver. Bremen, 13:207.

Limnesiopsis anomala Piersig, 1897. Sitzungsab. Naturf. Ges. Leipzig, 22/23:52.

Limnesiopsis anomala Marshall (in part), 1932. Trans. Wisconsin Acad. Sci., 27:346.

¹Contribution from the University of Michigan Biological Station.

Male: Length of body 1.3-1.5 mm; length of genital field 0.43-0.46 mm; width of genital field 0.49-0.54 mm.

Body rounded, integument soft; a pair of small sclerites present near posterior end of dorsum, these plates approximately 0.07 mm in length; acetabular plates broadly joined at both ends, length of genital opening less than one-half length of genital field; genital acetabula numerous (55-65 on each side), two pairs of acetabula considerably larger than the others; apodemes of posterior border of third coxae complete.

Palps large and powerful; the dorsal lengths of the palpal segments, in millimeters, varied as follows: P-I, 0.031-0.040 mm; P-II, 0.224-0.240 mm; P-III, 0.184-0.204 mm; P-IV, 0.392-0.406 mm; P-V, 0.092-0.095 mm; peg on ventral side of P-II located on a slightly raised tubercle, peg projecting directly outwards (Fig. 7); swimming hairs present on third and fourth pairs of legs; claws with minor clawlets present posterior to the major clawlets.

Female: Length of body 1.4-1.6 mm; length of genital field 0.35-0.37 mm; width of genital field 0.33-0.38 mm; width of pregenital sclerite 0.21-0.23 mm.

Body, legs and palps similar to those of male except that they average slightly larger; 58-67 genital acetabula on each side; acetabular plates not united as in male, but able to open and close over the genital valves; posterior portion of genital field only slightly wider than anterior portion.

Habitat: Most commonly taken in lakes but the author has one record from a permanent pond. Although this species is an excellent swimmer, it is often found crawling about in cracks and crevices of submerged logs.

Range: Marshall (1932) lists this species from New York, Wisconsin and Michigan. *Limnesia* (*Limnesiopsis*) *anomala* has been taken in only eleven Michigan counties. However, these are widely scattered and it is likely that this species occurs throughout the state.

Subgenus *Limnesiella* Daday

Limnesiella Daday, 1905. Zoologica, 44:306.

Neolimnesia Lundblad, 1936. Zool. Anz., 116:202.

Subgeneric diagnosis: Genital acetabula numerous; claws

without minor clawlets posterior to the major clawlets; small setae-bearing tubercles present on ventral side of fourth palpal segment.

Limnesia (Limnesiella) marshallae (Viets)

Figs. 3, 6, 8

Limnesiopsis anomala Marshall (in part), 1932. Trans. Wisconsin Acad. Sci., 27:346.

Limnesiopsis anomala marshallae Viets, 1938. Zool. Anz. 121:134.

Limnesia hutchinsoni Lundblad, 1941. *Ibid.*, 133:158.

(non) *Limnesia marshallae* Lundblad, 1941. *Ibid.*, 133:157.

Limnesia marshallae Lundblad, 1952. Arkiv för Zool. (Ser. 2), 3:525.

Male: Length of body 1.15-1.72 mm; length of genital field 0.27-0.35 mm; width of genital field 0.30-0.37 mm.

Body rounded, integument soft; a single, median sclerite, approximately 0.087-0.120 mm in diameter, present near posterior edge of dorsum; acetabular plates united at both ends, genital opening much greater than one-half total length of genital field; outer margin of acetabular plates concave; 22-27 genital acetabula present on each side, these roughly grouped into two circles of small acetabula surrounding the two pairs of larger acetabula; apodemes of posterior border of the third coxae incomplete, ending near setigerous gland of fourth coxae.

Palpi swollen at distal end of second segment, peg directed posteriorly, similar to that found in *Limnesia maculata* (Müller); dorsal lengths of the palpal segments were: P-I, 0.035-0.041 mm; P-II, 0.192-0.216 mm; P-III, 0.132-0.152 mm; P-IV, 0.282-0.335 mm; P-V, 0.059-0.074 mm; swimming hairs present on third and fourth pairs of legs; claws with only two major clawlets.

Female: Length of body 1.72-2.13 mm; length of genital field 0.28-0.36 mm; width of genital field 0.23-0.31 mm; width of pregenital sclerite 0.21-0.23 mm; female similar to male except in size and structure of the genital field; acetabular plates not united, 22-23 acetabula on each side, these grouped as in male.

Habitat: Usually found in lakes, often in rather deep

water. This species has also been taken in bogs and permanent ponds.

Range: Known only from Wisconsin and Michigan. *Limnesia marshallae* has been collected in eight Michigan counties, but as in *Limnesia anomala*, these are widely scattered and it probably is statewide in occurrence.

Remarks: *Limnesia marshallae* was originally described from a drawing by Ruth Marshall of the genital field of the male. Marshall (1932) included drawings of the ventral view of a female, genital field of a male and provisional genital field of a nymph, all labeled *Limnesiopsis anomala*. Viets (1938) recognized that the male was distinct and set it up as the variety *Limnesiopsis anomala marshallae*. Since none of the subgeneric characters were illustrated, Viets could not know that it was really a *Limnesiella* instead of a *Limnesiopsis*. Lundblad (1941) described a female from Wisconsin as *Limnesia (Limnesiella) hutchinsoni*. The present author sent a female specimen of *Limnesia marshallae* (Viets) to Lundblad and he found it to be identical with his *L. hutchinsoni*. The latter name therefore becomes a synonym. In the same paper Lundblad also described a new species of *Limnesia s.s.* under the name of *Limnesia marshallae*. This name is therefore a homonym and Lundblad (1952) has renamed the species *L. marshalliana*. One of the male specimens of *L. marshallae* (Viets) from Marshall's collection, now in the Chicago Natural History Museum, should be designated as lectotype.

***Limnesia (Limnesiella) eggletoni* n. sp.**

Figs. 4, 5, 9, 10, 11

Male: Length of body 0.88-1.08 mm; length of genital field 0.25-0.28 mm; width of genital field 0.26-0.31 mm.

Body rounded, integument soft; sclerites absent from posterior end of dorsum; acetabular plates united, outer margin convex; 14-18 genital acetabula present on each side, these grouped into anterior and posterior sets with a wide area free of acetabula between; posterior acetabular group arranged in the form of a hook about the large acetabula; apodemes of posterior border of third coxae complete; setigerous gland of fourth coxae located about

two-fifths distance between posterior ends of third and fourth coxae.

Palp swollen near distal end of second segment, peg directed outwards; setae present on fourth segment but these not on well developed tubercles; dorsal lengths, in millimeters, of the palpal segments varied as follows: P-I, 0.036-0.041 mm; P-II, 0.116-0.128 mm; P-III, 0.095-0.108 mm; P-IV, 0.160-0.169 mm; P-V, 0.047-0.052 mm; swimming hairs present on third and fourth pairs of legs; claws with two major clawlets.

Female: Length of body 1.27-1.39 mm; length of genital field 0.24-0.30 mm; width of genital field 0.19-0.23 mm; width of pregenital sclerite 0.16-0.17 mm.

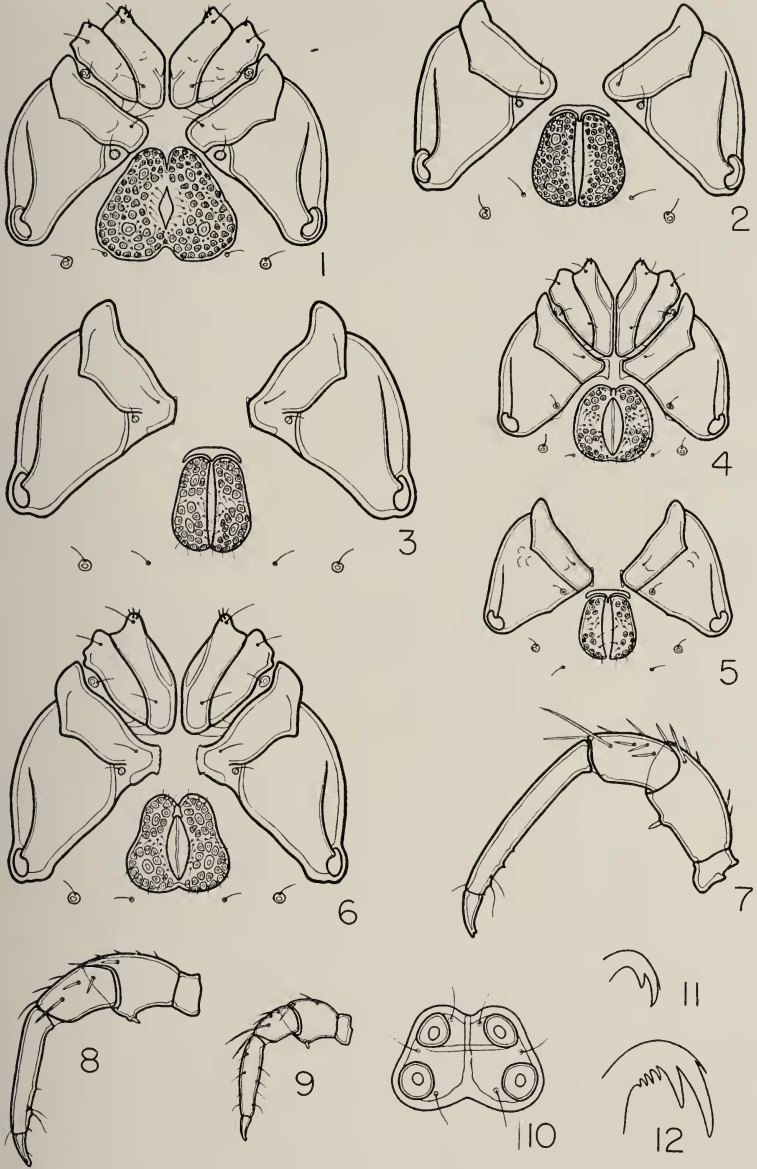
Female similar to male except in size, structure of the genital field and in having the setigerous glands of the fourth coxae much closer to the third coxae than in the male; acetabular plates not united, with 12-18 genital acetabula on each side, these arranged as in male; palpal segments averaging slightly larger than in male.

Nymph: Length of fully grown nymph approximately 0.55-0.59 mm.; length of provisional genital field 0.085-0.091 mm; width of provisional genital field 0.123-0.128 mm.

Provisional genital field with only two pairs of acetabula, apodemes forming a cross (Fig. 10); three pairs of setae present on provisional genital field; palps resembling those

EXPLANATION OF PLATE 11

Fig. 1. *Limnesia (Limnesiopsis) anomala* Koenike, ventral view, male. Fig. 2. *Limnesia (Limnesiopsis) anomala* Koenike, ventral view of third and fourth coxae, and genital field, female. Fig. 3. *Limnesia (Limnesiella) marshallae* (Viets), ventral view of third and fourth coxae, and genital field, female. Fig. 4. *Limnesia (Limnesiella) eggletoni* n. sp., ventral view, male. Fig. 5. *Limnesia (Limnesiella) eggletoni* n. sp., ventral view of third and fourth coxae, and genital field, female. Fig. 6. *Limnesia (Limnesiella) marshallae* (Viets), ventral view, male. Fig. 7. *Limnesia (Limnesiopsis) anomala* Koenike, palp, male. Fig. 8. *Limnesia (Limnesiella) marshallae* (Viets), palp, male. Fig. 9. *Limnesia (Limnesiella) eggletoni* n. sp., palp, male. Fig. 10. *Limnesia (Limnesiella) eggletoni* n. sp., provisional genital field, nymph. Fig. 11. *Limnesia (Limnesiella) eggletoni* n. sp., claw, male. Fig. 12. *Limnesia (Limnesiopsis) anomala* Koenike, claw, male.



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of adults except that the peg is absent and the distal end of the second segment is not as swollen; dorsal lengths of the palpal segments were: P-I, 0.019-0.024 mm; P-II, 0.067-0.078 mm; P-III, 0.058-0.064 mm; P-IV, 0.106-0.114 mm; P-V, 0.035-0.038 mm.

Holotype: Adult male, taken in Nichols' Bog, Cheboygan County, Michigan (T36N/R3W/S2) on July 24, 1952.

Allotype: Adult female, same date and locality as holotype.

Paratypes: 32 males, 33 females, 14 nymphs, same date and locality as holotype; 9 males, 11 females, 6 nymphs, same locality on July 13, 1952; 6 males, 10 females, collected in a temporary pond near Big Star Lake, Lake County, Michigan (T17N/R14W/S25) on April 30, 1952; one male, found in Whitmarsh Lake, Chippewa County, Michigan (T45N/R5W/S6) on July 29, 1949.

Habitat: Usually taken in temporary and semipermanent ponds and bogs. However, they are occasionally found in small lakes.

Range: At present this species is known only from the northern half of the lower peninsula and the eastern half of the upper peninsula of Michigan.

Remarks: *Limnesia eggletoni* most closely resembles the South American species *L. malacoderma* Lundblad. However, the new species may be separated from the latter by the position of the setigerous glands of the fourth coxae and by the fact that the nymphs have only two pairs of genital acetabula. The nymphs of *L. malacoderma* (and all of the known *Limnesiella* nymphs from South America) are polyacetabulate. The holotype and allotype will be placed in the Chicago Natural History Museum, paratypes will be deposited in the United States National Museum.

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